REMARKS

The final Office Action mailed October 19, 2006, has been received and reviewed.

Claims 1-60 are currently pending and under consideration in the above-referenced application. Each of claims 1-60 stands rejected.

Reconsideration of the above-referenced application is respectfully requested.

Rejections under 35 U.S.C. § 103(a)

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Pramanik in View of Noguchi

Claims 1, 3, 12, 13 and 16-18 stand rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is allegedly unpatentable over the subject matter taught in U.S. Patent 5,852,497 to Pramanik et al. (hereinafter "Pramanik"), in view of U.S. Patent 5,361,150 to Noguchi (hereinafter "Noguchi").

Pramanik describes a process for locating or identifying conventional alignment marks on a substrate. Col. 1, lines 63-65; col. 10, lines 36-39. The alignment marks that are identified in the process of Pramanik comprise shallow trench isolation (STI) structures that are covered by one or more layers of opaque material. Col. 2, lines 60-63. The process of Pramanik is effected only after the substrate has been brought to a desired destination—a photolithography apparatus in which photoresist is selectively exposed to radiation. *See* col. 4, lines 10-26. When the positions of the alignment marks have been identified, one or both of the substrate and a reticle

may be oriented to align the substrate and the reticle with one another. Col. 3, line 45; *see also* col. 1, lines 27-30.

Noguchi describes liquid crystal displays (LCDs) with identification marks. The identification mark of an LCD according to Noguchi includes a character pad 13 that is formed in or from an opaque thin film 7. Col. 4, lines 10-20. Noguchi clearly indicates that "no opaque thin film is laminated on the character pad 13" (col. 4, lines 51-54), with the possible exception of a reflective lower metal film 17, which apparently facilitates unimpeded, direct viewing from beneath the character pad 13 (*e.g.,* from location 12 of FIG. 6) through a transparent glass substrate 1 over which the character pad 13 is formed (*see* col. 4, lines 59-64). Instead of an opaque material, only transparent films (lower and upper insulating films 8 and 11) are laminated over the character pad 13. Col. 4, lines 54-64. Noguchi requires that these transparent films have a light transmission factor of at least 90% for visible wavelengths of electromagnetic radiation (starting at about 350 nm). Col. 5, lines 16-18. According to Noguchi, the opacity of the film does not increase for higher wavelengths. *See id.* By ensuring that the character pad 13 is covered only with transparent materials, the identification mark formed thereby "can be visually viewed by a human being and by sensor devices." Col. 5, lines 9-12.

It is respectfully submitted that a *prima facie* case of obviousness has not been established against independent claim 1. In particular, Noguchi teaches away from the subject matter recited in independent claim 1, and, therefore, one of ordinary skill in the art would not have been motivated to combine the teachings of Pramanik and Noguchi to arrive at the invention recited in independent claim 1. Independent claim 1 is directed to a method which includes visualizing characters through at least one layer of material which is *opaque to at least visible wavelengths* of electromagnetic radiation. Conversely, while the glass layers that cover the markings described in Noguchi may be opaque to some wavelengths, Noguchi clearly teaches limiting the layers to materials that are *transparent to visible wavelengths*. Col. 4, line 48, to col. 5, line 12.

It is asserted by the Examiner, on page 16 of the Office Action dated October 19, 2006, that the teachings of both Pramanik and Noguchi are directed to devices for identifying marks found in a substrate. It is respectfully submitted that the teachings of Pramanik are limited to

simply detecting a structure through a layer opaque to visible wavelengths. As a result, Pramanik provides no teaching or suggestion of correlating the structure to a characteristic which distinguishes the mark from other marks and identifies the type of semiconductor device being fabricated on the substrate. Noguchi includes teachings directed to marks that can be viewed through transparent material by a human being or by a sensor device. Therefore, Noguchi provides no teaching or suggestion of viewing or characterizing marks through layers opaque to visible light. Consequently, neither Pramanik nor Noguchi teaches or suggests this element of independent claim 1.

As Pramanik and Noguchi both lack any teaching or suggestion of viewing or characterizing marks through layers that are opaque to visible light, it is also respectfully submitted that one of ordinary skill in the art wouldn't have been motivated to combine the teachings of these references in the manner that has been asserted. Further, since Noguchi teaches that marks may be viewed only through materials that are transparent to visible light, Noguchi teaches away from the asserted combination, as well as from the subject matter recited in claim 1. It is, therefore, apparent that the Examiner has improperly relied upon the hindsight provided by the claims of the above-referenced application in asserting that one of ordinary skill in the art would have been motivated to combine the teachings of Pramanik and Noguchi in the manner that has been asserted.

Therefore, it is respectfully submitted that a *prima facie* case of obviousness has not been established against independent claim 1. Accordingly, it is respectfully submitted that, under 35 U.S.C. § 103(a), claim 1 recites subject matter which allowable over the teachings of Pramanik and Noguchi.

Claims 3, 12, 13, and 16-18 are each allowable, among other reasons, for depending directly from claim 1, which is allowable.

Pramanik in View of PAPA

Claims 21, 23, 32, 33, and 36-38 stand rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is allegedly unpatentable over the subject matter taught in U.S.

Patent 5,852,497 to Pramanik in view of purportedly admitted prior art (hereinafter "PAPA") teachings.

The PAPA upon which the Office relies in rejecting claims 21, 23, 32, 33, and 36-38 is the use of visible characters or other indicia to identify a semiconductor device or substrate, as well as a possible destination for the semiconductor device or substrate.

Independent claim 21 recites a method for determining a destination of a semiconductor device substrate. That method includes identifying a mark that comprises at least one recess within a surface of the semiconductor device substrate, which mark is covered with at least one layer of material. Such identification includes scanning electromagnetic radiation over a plurality of locations of the substrate, detecting locations at which an intensity of the electromagnetic radiation changes from substantially a baseline intensity, and correlating each such location to identify the mark. Once the mark has been identified, a predetermined destination for the substrate may also be identified.

It is respectfully submitted that a *prima facie* case of obviousness has not been established against any of claims 21, 23, 32, 33 or 36-38 because, without the benefit of hindsight that the rejected claims provide to the Office, one of ordinary skill in the art would not have been motivated to combine teachings from Pramanik with the PAPA in the asserted manner. Specifically, Pramanik and the PAPA both lack any teaching or suggestion of indicia that are useful for identifying a particular destination for one or more semiconductor devices may be recognized and identified by the system of Pramanik. Rather, the teachings of Pramanik are limited to recognition of relatively uniform, repeated STI structures on a substrate in order to align the substrate and a reticle with one another after the substrate is already present at its intended destination – within a photoresist exposure apparatus. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

Therefore, it is respectfully submitted that it would not have been obvious to one of ordinary skill in the art to modify or combine the teachings of Pramanik and the PAPA in the manner that has been asserted.

For these reasons, it is respectfully submitted that a *prima facie* case of obviousness has not been established against any of claims 21, 23, 32, 33 or 36-38 because there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings as described by the Examiner.

Therefore, under 35 U.S.C. § 103(a), the subject matter to which each of claims 21, 23, 32, 33, and 36-38 is directed is allowable under 35 U.S.C. § 103(a).

Pramanik in View of Noguchi and PAPA

Claims 2, 6-11, 14, 15, 22, 26-31, 34 and 35 stand rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is allegedly unpatentable over the subject matter taught in U.S. Patent 5,852,497 to Pramanik (in view of U.S. Patent 5,361,150 to Noguchi for Claims 2, 6-11, 14, and 15 in view of PAPA for Claims 22, 26-31, 34, and 35).

Each of claims 2, 6-11, 14 and 15 is allowable since, as described above in reference to independent claim 1, Noguchi teaches away from the combination thereof with Pramanik to arrive at the subject matter recited in claims 2, 6-11, 14, and 15, and, therefore, it would not have been obvious to one of ordinary skill in the art to modify or combine the teachings of Pramanik and Noguchi in the asserted manner.

Claims 2, 6-11, 14 and 15 are also allowable, among other reasons, for depending directly from claim 1, which is allowable.

Each of claims 22, 26-31, 34 and 35 is allowable since, as described above in reference to claim 21, it would not have been obvious to one of ordinary skill in the art to modify or combine the teachings of Pramanik and the PAPA in the manner that has been asserted.

Each of claims 22, 26-31, 34 and 35 is also allowable, among other reasons, for depending directly from claim 21, which is allowable.

Pramanik in View of Noguchi, PAPA, and Bareket

Claims 4, 5, 19, 20, 24, 25, 39 and 40 stand rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is allegedly unpatentable over the subject matter taught in U.S.

Patent 5,852,497 to Pramanik (in view of U.S. Patent 5,361,150 to Noguchi for Claims 4, 5, 19 and 20 in view of PAPA for Claims 24, 25, 39 and 40) in view of U.S. Patent 5,889,593 to Bareket (hereinafter "Bareket").

Bareket teaches an optical system and methods. The optical system of Bareket includes an angle-dependent reflectometer with multiple detection elements for detecting radiation which is reflected at different angles. Col. 3, lines 51-67. In addition, that system includes a processing system that acquires and analyzes data of the detected, reflected radiation. Col. 3, line 67, to col. 4, line 7. The system of Bareket is useful for optically inspecting semiconductor wafers, including the widths of conductive lines or other "periodic text patterns" on the surfaces of the semiconductor wafers. *See, e.g.,* Abstract, col. 4, lines 4-10; col. 7, line 59, to col. 8, line 8.

Each of claims 4, 5, 19 and 20 is allowable since Bareket does not remedy the fact that, as described above in reference to independent claim 1, Noguchi teaches away from the combination thereof with Pramanik to arrive at the subject matter recited in claims 4, 5, 19, and 20, and, therefore, it would not have been obvious to one of ordinary skill in the art to modify or combine the teachings of Pramanik and Noguchi in the asserted manner.

Claims 4, 5, 19 and 20 are also allowable, among other reasons, for depending directly from claim 1, which is allowable.

Each of claims 24, 25, 39 and 40 is allowable since Bareket does not remedy the fact that, as described above in reference to claim 21, it would not have been obvious to one of ordinary skill in the art to modify or combine the teachings of Pramanik and the PAPA in the asserted manner.

Each of claims 24, 25, 39 and 40 is also allowable, among other reasons, for depending directly from claim 21, which is allowable.

Noguchi in View of Pramanik

Claims 41 and 49-54 stand rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is allegedly unpatentable over the subject matter taught in U.S. Patent 5,361,150 to Noguchi in view of U.S. Patent 5,852,497 to Pramanik.

Independent claim 41 is drawn to a system for identifying a marking on a substrate indicative of a type of semiconductor device being fabricated on the substrate and at least partially covered by at least one layer of material. The system of independent claim 41 includes, among other things, at least one radiation source configured and positioned to direct electromagnetic radiation of at least one wavelength toward a substrate, the at least one wavelength capable of at least partially penetrating a material that is substantially opaque to at least visible wavelengths of electromagnetic radiation. In addition, the system of independent claim 41 includes at least one reflectometer positioned so as to receive electromagnetic radiation of the at least one wavelength reflected from a location of the substrate covered with the material that is substantially opaque to at least visible wavelengths of electromagnetic radiation.

It is respectfully submitted that, for the same reasons presented above, one of ordinary skill in the art wouldn't have been motivated to combine the teachings of Noguchi and Pramanik in the manner that has been asserted. Thus, a *prima facie* case of obviousness has not been established against independent claim 41.

Furthermore, Noguchi teaches away from the subject matter disclosed in Pramanik, as well as from the subject matter recited in independent claim 41. While the glass layers that cover the markings described in Noguchi may be opaque to some nonvisible wavelengths of electromagnetic radiation, Noguchi clearly teaches limiting the layers to materials that are *transparent to visible wavelengths*. Col. 4, line 48, to col. 5, line 12. Pramanik, in contrast, teaches that STI structures may be located through opaque materials, while independent claim 41 recites that a system for identifying a marking which includes use of at least one wavelength capable of at least partially penetrating a material substantially *opaque to at least visible wavelengths* of electromagnetic radiation.

Since Noguchi teaches away from the asserted combination, as well as from the subject matter recited in independent claim 41, it is apparent that the only way one of ordinary skill in the art would have been motivated to combine the teachings of Noguchi and Pramanik to arrive at the claimed invention would have been through improper hindsight provided by the disclosure and claims of the above-referenced application.

Therefore, it is respectfully submitted that a *prima facie* case of obviousness has not been established against independent claim 41. Accordingly, it is respectfully submitted that, under 35 U.S.C. § 103(a), claim 41 recites subject matter which allowable over the teachings of Noguchi and Pramanik.

Claims 49-54 are each allowable, among other reasons, for depending directly from claim 41, which is allowable.

Noguchi in View of Pramanik and Duncan

Claims 42-48 and 55-58 stand rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is allegedly unpatentable over the subject matter taught in U.S. Patent 5,361,150 to Noguchi in view of U.S. Patent 5,852,497 to Pramanik, further in view of U.S. Patent 4,585,931 to Duncan et al. (hereinafter "Duncan").

Each of claims 42-48 and 55-58 is allowable since Duncan does not remedy the fact that, as described above, Noguchi teaches away from the combination thereof with Pramanik to arrive at the subject matter recited in claims 42-48 and 55-58 and, therefore, it would not have been obvious to one of ordinary skill in the art, to modify or combine the teachings of Pramanik and the Noguchi to include the elements of the claimed invention.

Each of claims 42-48 and 55-58 is allowable, among other reasons, for depending either directly or indirectly from claim 41, which is allowable.

Bareket in View of Noguchi

Claims 59 and 60 stand rejected under 35 U.S.C. § 103(a) for being drawn to subject matter that is allegedly unpatentable over the subject matter taught in U.S. Patent 5,889,593 to Bareket in view of U.S. Patent 5,361,150 to Noguchi.

Independent claim 59 is directed to a processor for characterizing at least one material-covered recessed marking formed in a substrate and a type of semiconductor device being fabricated on the substrate. The processor of independent claim 59 includes at least one logic circuit for comparing a measured intensity of at least one wavelength of reflected radiation to a baseline intensity of the at least one wavelength of radiation reflected from a planar portion

of the substrate and through at least one material layer that is substantially opaque to at least visible wavelengths of electromagnetic radiation, as well as at least one logic circuit for mapping a plurality of locations of the substrate where the measured intensity differs from the baseline intensity. The resulting map comprises a digital image of the recessed marking. The processor of independent claim 59 also includes at least one logic circuit for identifying a type of semiconductor device that corresponds to the mapped locations.

It is respectfully submitted that a *prima facie* case of obviousness has not been established against independent claim 59 because the prior art references, individually or combined, do not teach or suggest all of the claim limitations. Specifically, neither Bareket nor Noguchi teaches or suggests a processor which is configured to compare a measured intensity of at least one wavelength of reflected radiation to a baseline intensity of the at least one wavelength of radiation reflected from a planar portion of the substrate and through at least one material layer that is *substantially opaque to at least visible wavelengths* of electromagnetic radiation and, based upon such comparison, to map locations where the baseline intensity and the measured intensity differ from one another.

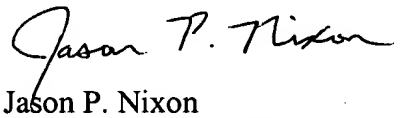
Therefore, it is respectfully submitted that, under 35 U.S.C. § 103(a), independent claim 59 is allowable over the combination of Bareket and Noguchi.

Claim 60 is allowable, among other reasons, for depending from claim 59, which is allowable.

CONCLUSION

Claims 1-60 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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